DRAFT

ENGINEERING EVALUATION
VERIZON WIRELESS (HWY 580/HWY 13)
PLANT NO. 16417
APPLICATION NO. 10739

BACKGROUND

Verizon Wireless is applying for an Authority to Construct and/or Permit to Operate for the following equipment:

S-1 Emergency Standby Generator Set: Diesel Engine; Make: John Deere; Model: 5030HF270; Rated Horsepower: 96 HP

The standby generator set will be used at 5000 MacArthur Blvd., Oakland, CA 94613. It will provide emergency power (in the event of a blackout) for all essential electrically powered equipment at the Verizon Wireless Cellular site. The emergency engine must be periodically tested to ensure that it will generate electricity during an emergency electrical outage. Testing may not conducted between 7:30 a.m. and 3:30 p.m. on days when school is in session.

EMISSIONS SUMMARY

Annual Emissions:

The 96 HP diesel engine at S-1 was tested per ISO8178-D2 and the emission factors are listed below.

Component	Emission (g/bhp·hr)
NOx	5.065
CO*	0.75
POC	0.343
PM_{10}	0.089
SO_2**	0.184

**The value for CO was obtained from CARB certified data, while all other emissions values (besides SO_2), tested under the ISO-8178 D2 cycle were provided by the engine manufacturer submitted by the applicant.*
***The emission factor for SO2 is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

SO_2 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.05% S) (454 g/lb) = 0.184 g/hp-hr

NOx	=	5.065	g/bhp-hr *	96	hp *	33	hrs/yr *	lb/454 g	=	35.343 lbs/yr	= 0.01767 TPY
CO	=	0.75	g/bhp-hr *	96	hp *	33	hrs/yr *	lb/454 g	=	5.233 lbs/yr	= 0.00262 TPY
POC	=	0.343	g/bhp-hr *	96	hp *	33	hrs/yr *	lb/454 g	=	2.393 lbs/yr	= 0.00120 TPY
PM_{10}	=	0.089	g/bhp-hr *	96	hp *	33	hrs/yr *	lb/454 g	=	0.621 lbs/yr	= 0.00031 TPY
SO_2	=	0.184	g/bhp-hr *	96	hp *	33	hrs/yr *	lb/454 g	=	1.284 lbs/yr	= 0.00064 TPY

Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

NOx	=	5.065	g/bhp-hr *	96	hp *	24	hrs/day *	lb/454 g	=	25.704	lbs/day
CO	=	0.75	g/bhp-hr *	96	hp *	24	hrs/day *	lb/454 g	=	3.806	lbs/day
POC	=	0.343	g/bhp-hr *	96	hp *	24	hrs/day *	lb/454 g	=	1.741	lbs/day
PM_{10}	=	0.089	g/bhp-hr *	96	hp *	24	hrs/day *	lb/454 g	=	0.452	lbs/day
SO_2	=	0.184	g/bhp-hr *	96	hp *	24	hrs/day *	lb/454 g	=	0.934	lbs/day

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NOx	0	0.0177	0.0177
CO	0	0.0026	0.0026
POC	0	0.0012	0.0012
PM_{10}	0	0.0003	0.0003
SO_2	0	0.0006	0.0006
NPOC	0	0.0000	0.0000

Toxic Risk Screening:
The toxic emission of diesel particulate does not exceed the District Risk Screening Trigger, as shown in Table (1) below. The applicant has accepted a permit condition of 33 hours of operation for maintenance and reliability testing per letter dated September 24, 2004.

Table 1

Source:	PM_{10} Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year)	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.089	96	33	0.621	0.64	NO

STATEMENT OF COMPLIANCE

S-1 will be operated as emergency standby engines and therefore are not subject to the emission rate limits in Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO2 limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is expected since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). These engines are not expected to produce visible emissions or fallout in violation of this regulation and they will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This facility is in compliance with the Airborne Toxic Control Measure (ATCM), including testing and maintenance operational hours during school hours.

This application is considered to be ministerial under the District's proposed CEQA guidelines (Regulation 2-1-312) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

PUBLIC COMMENT

The project is within a thousand feet of a public school and therefore subject to the public notification requirements of Reg. 2-1-412. The public notice will be posted on the internet and mailed to all Parents or Guardians with children enrolled at Mills College Children's School. It will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

Best Available Control Technology:

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2 or PM_{10}.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutants: NOx. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet the BACT 2 limits presented below.

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
NOx	1. *1.5 g/bhp-hr [107 ppmvd @ 15% O_2]* [a,b] 2. *6.9 g/bhp-hr [490 ppmvd @ 15% O_2]* [a,b,c] 3. *6.9 g/bhp-hr [490 ppmvd @ 15 % O_2]*	1. *Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler* [a,b] 2. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler* [a,b,c] 3. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler*

For NOx, the emission limits set by BACT 2 are met, as shown in Table (2) below.

Table (2)

Pollutant	Engine Emission Factors with Catalyst (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NOx	5.065	6.9	YES

Therefore, S-1 is determined to be in compliance with the BACT 2 limits for NOx.

Since data obtained through the ISO 8178-D2 test method was used to establish the NOx emission factors, the BACT 2 emission limits have not been incorporated into the permit conditions and are assumed to be complied with through the design standards demonstrated by the ISO 8178-D2 test method.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 15 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Application 10739; Verizon Wireless (HWY 580/HWY 13); Plant 16417; Conditions for S-1 Emergency Diesel Generator: (PC# 21794)

1. The owner/operator of emergency generator S-1 shall use only diesel fuel having a sulfur content no greater than 0.05% by weight. The sulfur content of the fuel oil shall be certified by the fuel oil vendor.
   (Basis: Cumulative Increase)

2. The owner/operator of S-1 shall only operate this engine to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 33 hours in any calendar year. Operation while mitigating emergency conditions is unlimited.
   (Basis: Regulation 9-8-330, Cumulative Increase, Toxic Risk Screening)

   "Emergency Conditions" is defined as any of the following:
   (Basis: Regulation 9-8-231)
   a. Loss of regular natural gas supply
   b. Failure of regular electric power supply
   c. Flood mitigation
   d. Sewage overflow mitigation

e. Fire
f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor

"Reliability-related activities" is defined as any of the following:
(Basis: Regulation 9-8-232)
a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
b. Operation of an emergency standby engine during maintenance of a primary motor

3. The owner/operator of S-1 shall provide this engine with either:
(Basis: Regulation 9-8-530)
a. a non-resettable totalizing meter that measures and records the hours of operation for the engine
b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

4. The owner/operator of S-1 shall maintain the following monthly records. These records shall be kept in a District-approved log for at least 2 years and shall be made available for District inspection upon request:
(Basis: Regulations 9-8-530, 1-441)
a. Total hours of operation
b. Hours of operation under emergency conditions and a description of the nature of each emergency condition
c. Fuel usage.

RECOMMENDATION

Issue an Authority to Construct to Verizon Wireless (HWY 580/HWY 13) for the following source:

S-1 Emergency Standby Generator Set: Diesel Engine; Make: John Deere; Model: 5030HF270; Rated Horsepower: 96 HP

EXEMPTIONS
None.

By:_____ Date:_____
Madhav Patil
Air Quality Engineer